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EXAMINER

BENGZON, GREG C

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/070,338	<b>Applicant(s)</b> KARAM ET AL.	
	<b>Examiner</b> GREG BENZON	<b>Art Unit</b> 2444	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 26 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-13, 15-36, 38-50 and 52-54 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13, 15-36, 38-50 and 52-54 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>08/25/2008, 10/06/2008</u> .                                  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

This application has been examined. Claims 1-13,15-36,38-50, 52-54 are pending. Claims 14,37, 51 are cancelled. Claim 54 is submitted as a new claim.

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/26/2008 has been entered.

### ***Priority***

This application claims benefits of priority from Provisional Application 60/241450 filed October 17, 2000.

The effective date of the claims described in this application is October 17, 2000.

***Information Disclosure Statement***

The information disclosure statements (IDS) submitted on 08/25/2008, 10/06/2008 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner.

***Allowable Subject Matter***

Claims 52, 53 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the

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subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1,4,5, 17-21,24,27,28, 40-44,48,50,54 are rejected under 35

U.S.C. 103(a) as being unpatentable over Juttner (US Patent 7020086) in view of what was well-known in the art.

Juttner disclosed (re. Claim 1) a network path, including a first segment and a second segment (Juttner-Column 3 Lines 5-15)

Juttner disclosed (re. Claim 1) modeling equations for deriving first and second metrics, wherein the first and second metrics are at least in part quality characterizations of a same plurality of one or more network applications; (Juttner-Column 11 Lines 40-45)

However Juttner did not disclose modeling '*negative linear exponential equations*'.

The Examiner notes that at the time of the invention the use of negative exponents in exponential equations was well-known in the networking art for describing an attribute of decreasing value such as in the context of decay functions, degradation curves and damping rates. Juttner Column 13 Lines 55-65 figure 9, Column 14 Lines

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20-45 disclosed that there is a point in time wherein where a path can be found for all source-destination pairs, at which point the average cost of the paths will decrease with the delay bound since the algorithms are able to find paths with lower costs and higher delay bounds. Thus Juttner is describing an attribute with decreasing value and hence it would have been obvious that this portion of the Juttner curve may be described using negative exponents in exponential equations. The motivation for said combination would have been to enable mathematical models that describe the network attributes concisely and consistently.

Juttner disclosed (re. Claim 1) accessing a first metric and a second metric generated to have a common format (Juttner-Column 2 Lines 40-45, Column 11 Lines 40-45) , wherein the first metric and the second metric are at least in part quality characterizations of a same plurality of one or more network applications (Juttner-Column 1 Lines 40-45), the quality characterization characterizes a quality of the same plurality of one or more network applications running at one or more segment end-points (Juttner-Column 2 Lines 1-5), the first metric and the second metric are at least partly a function of a same plurality of one or more elementary network parameters (Juttner-Column 2 Lines 40-45, Column 11 Lines 40-45), the plurality of one or more network parameters include one or more of delay (Juttner-Column 2 Lines 40-45, Column 11 Lines 40-45), jitter, loss, currently available bandwidth, and intrinsic bandwidth, the first metric is at least partly the function of the same plurality of

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elementary network parameters of the first segment (Juttner-Column 2 Lines 40-45, Column 11 Lines 40-45) , the one or more segment end points include one or more endpoints of the first segment, the second metric (Juttner-Column 2 Lines 40-45, Column 11 Lines 40-45) is at least partly the function of the same plurality of elementary network parameters (Juttner-Column 2 Lines 40-45, Column 11 Lines 40-45) of the second segment, and the one or more segment end points include one or more endpoints of the second segment; and

adding the first metric and the second metric to generate a third metric (Juttner-Column 3 Lines 10-15,Column 11 Lines 30-45), wherein the third metric is at least partly the function of the same plurality of one or more elementary network parameters of the network path, the one or more segment end points include one or more endpoints of the network path, and

the third metric is a quality characterization of the same plurality of one or more applications.

Claim 24 is rejected on the same basis as Claim 1.

Juttner disclosed (re. Claim 4,27) wherein at least one of the plurality of one or more network parameters is dynamic.( Juttner-Column 2 Lines 1-5, Juttner-Column 3 Lines 10-15) The Examiner notes delay and jitter are dynamic parameters.

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Juttner disclosed (re. Claim 5,28) wherein at least one of the plurality of one or more network parameters is static. ( Juttner-Column 2 Lines 1-5, Juttner-Column 3 Lines 10-15) The Examiner notes that the hop count is static.

Juttner disclosed (re. Claim 17,40) a delay parameter. (Juttner-Column 2 Lines 1-5, Juttner-Column 3 Lines 10-15)

Juttner disclosed (re. Claim 18,41) wherein the plurality of one or more network parameters include jitter (Juttner-Column 3 Lines 30-40) ; (re. Claim 19,42) wherein the plurality of one or more network parameters include loss (Juttner-Column 3 Lines 30-40); (re. Claim 20,43) wherein the plurality of one or more network parameters include currently available bandwidth (Juttner-Column 5 Lines 65) ; (re. Claim 21,44) wherein the plurality of one or more network parameters include intrinsic bandwidth (Juttner-Column 5 Lines 65);

Juttner disclosed (re. Claim 48) wherein the function of the same plurality of one or more elementary network parameters is a combination of multiple component functions, (Juttner-Column 2 Lines 40-45, Column 11 Lines 40-45), wherein each of the



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multiple component functions is tailored to measure a performance characteristic of a corresponding one of the one or more elementary network parameters.

Juttner disclosed (re. Claim 50 ) wherein modeling equations comprises fitting curves corresponding to the quality characterizations. (Juttner -Column 13 Lines 50-60)

Claim 54 is rejected on the same basis as Claim 1.

Furthermore, Juttner disclosed (re. Claim 54) using products of negative exponential functions for deriving first and second metrics.

The Applicant indicates the limitation '*products of negative exponential functions*' as embodied by a mathematical formula as shown in Applicant Specification Page 8 Line 24. The Examiner notes that the said formula follows the basic algebra rules for operating on exponential identities, such as described by the following :  $x^a x^b = x^{(a+b)}$ . The said rule indicates using products of exponential functions.

The Examiner notes that Juttner did not disclose modeling '*negative linear exponential equations*'.

The use of non-linear exponential or non-linear regression models were well-known in the networking art.

Furthermore the Examiner notes that at the time of the invention the use of negative exponents in exponential equations was well-known in the networking art for describing an attribute of decreasing value such as in the context of decay functions, degradation curves and damping rates.

Juttner Column 13 Lines 55-65 figure 9, Column 14 Lines 20-45 disclosed that there is a point in time wherein where a path can be found for all source-destination pairs, at which point the average cost of the paths will decrease with the delay bound since the algorithms are able to find paths with lower costs and higher delay bounds. Thus Juttner is describing an attribute with decreasing value and hence it would have been obvious that this portion of the Juttner curve may be described using negative exponents in exponential equations. The motivation for said combination would have been to enable mathematical models that describe the network attributes concisely and consistently.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the

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subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2,3,6-13,15-16,25,26,29-36,38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Juttner (US Patent 7020086) in view of Hultgren (US Patent 6134589).

While Juttner substantially described the invention, Juttner did not disclose (re. Claim 2,25) prior to accessing the first or the second metric, generating at least one of the first metric and the second metric (Juttner-Column 2 Lines 1-5, Juttner-Column 3 Lines 10-15)

Hultgren disclosed (re. Claim 2,25) prior to accessing the first or the second metric, generating at least one of the first metric and the second metric (Hultgren-Column 13 Lines 30-65)

Juttner and Hultgren are analogous art because they disclose concepts and practices regarding determining path quality using linear equations. Accordingly, at the time of the invention it would have been obvious to a person of ordinary skill in the networking art to combine the teachings of Hultgren into Juttner. The motivation for said combination would have been, (Hultgren-Column 1 Lines 60-65), to determine an acceptable sequence of links for UDP, TCP, and HTTP applications.

Juttner-Hultgren disclosed (re. Claim 3,26) prior to accessing the first or the second metric, receiving at least one of the first metric and the second metric.  
(Hultgren-Column 13 Lines 30-65)

Juttner did not disclose (re. Claim 6,7,11,29,30,34) UDP and TCP applications [where the UDP applications involve voice applications and TCP applications involve data transfer applications.]

Juttner did not disclose (re. Claim 12,13,35,36) HTTP, HTTP/1.0, and HTTP/1.1 applications [where HTTP applications include data transfer applications.]

Hultgren disclosed (re. Claim 6,7,11,29,30,34) UDP and TCP applications [where the UDP applications involve voice applications and TCP applications involve data transfer applications.] (Hultgren-Column 6 Lines 35-45)

Juttner and Hultgren are analogous art because they disclose concepts and practices regarding determining path quality using linear equations. Accordingly, at the time of the invention it would have been obvious to a person of ordinary skill in the networking art to combine the teachings of Hultgren into Juttner. The motivation for

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said combination would have been, (Hultgren-Column 1 Lines 60-65), to determine an acceptable sequence of links for UDP, TCP, and HTTP applications.

Hultgren disclosed (re. Claim 12,13,14,35,36,37) HTTP, HTTP/1.0, and HTTP/1.1 applications [where HTTP applications include data transfer applications.] (Hultgren-Column 6 Lines 35-45)

Juttner and Hultgren are analogous art because they disclose concepts and practices regarding determining path quality using linear equations. Accordingly, at the time of the invention it would have been obvious to a person of ordinary skill in the networking art to combine the teachings of Hultgren into Juttner. The motivation for said combination would have been, (Hultgren-Column 1 Lines 60-65), to determine an acceptable sequence of links for UDP, TCP, and HTTP applications.

Juttner-Hultgren disclosed (re. Claim 8,9,10,31,32,33) network applications including voice, video, and video conferencing; (Juttner-Column 1 Lines 40-50);

Juttner-Hultgren disclosed (re. Claims 15,38) ftp applications (Juttner-Column 1 Lines 40-50);

Juttner-Hultgren disclosed (re. Claim 16,39) telnet applications (Juttner-Column 1 Lines 40-50).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 22-23, 45-46, 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Juttner (US Patent 7020086) in view of Saleh (US Patent 7002917).

Juttner did not disclose (re. Claim 22,45) wherein the metric includes non-performance related characteristics; (re. Claim 23,46) wherein the non-performance related characteristics includes pre-specified route preferences.

Saleh disclosed (re. Claim 22,45) wherein the metric includes non-performance related characteristics (Saleh-Column 5 Lines 25-30, Column 33 Lines 35-40); (re. Claim 23,46) wherein the non-performance related characteristics includes pre-specified route preferences. (Saleh-Column 5 Lines 25-30, Column 33 Lines 35-40)

Juttner and Saleh are analogous art because they present concepts and practices regarding path characterization measurements. Accordingly, at the time of the

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invention it would have been obvious to a person of ordinary skill in the networking art to combine the teachings of Saleh and Juttner. The motivation for said combination would have been, as Saleh suggests (Saleh-Column 2 Lines 15-20), to implement a fast, efficient method for the most preferable path.

While Juttner disclosed (re. Claim 47) first, second, and third metric, Juttner did not disclose (re. Claim 47) a plurality of one or more inputs adapted to be coupled to the network path; and a plurality of one or more outputs coupled to the plurality of one or more inputs, wherein responsive to a plurality of one or more packets arriving to the network device through the plurality of one or more inputs, the network device selects at least one output from the plurality of one or more outputs, and the at least one output is determined at least partly using at least one of the first metric, second metric, and third metric.

Saleh disclosed (re. Claim 47) a path matrix configuration (Saleh-Column 23 Lines 1-5) and adding the metric from each segment (corresponding to first metric, second metric, and third metric) (Column 33 Lines 35-40) in order to select the desired path (Column 32 Lines 50-55).

Juttner and Saleh are analogous art because they present concepts and practices regarding path characterization measurements. Accordingly, at the time of the invention it would have been obvious to a person of ordinary skill in the networking art to combine the teachings of Saleh and Juttner. The motivation for said combination would

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have been, as Saleh suggests (Saleh-Column 2 Lines 15-20), to implement a fast, efficient method for the most preferable path.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Juttner (US Patent 7020086) in view of Hardy (US Patent 7085230).

While Juttner substantially disclosed the claimed invention Juttner did not disclose (re. Claim 49) wherein the first metric and the second metric are both derived from mean opinion scores.

Hardy disclosed disclose (re. Claim 49) wherein the first metric and the second metric are both derived from mean opinion scores. (Hardy-Figure 2, Column 4 Lines 40-45)



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Juttner and Hardy are analogous art because they present concepts and practices regarding performance metrics for network analysis. At the time of the invention it would have been obvious to a person of ordinary skill in the art to combine Hardy into Juttner. The motivation for said combination would have been to enable taking into account multiple added impairments, apportioning the influences of each added impairment toward the composite quality requirements. (Hardy-Column 4 Lines 5-10)

### ***Response to Arguments***

Applicant's arguments filed 11/26/2008 have been considered but are not persuasive.

The Applicant presents the following argument(s) *[in italics]*:

*... none of the cited references disclose using negative exponentials, much less products of negative exponentials. Nor do any of the cited references disclose metrics that are a function of network parameters whose individual performance is modeled using a negative exponential function.*

The Examiner respectfully disagrees with the Applicant.

The use of non-linear exponential or non-linear regression models were well-known in the networking art.

Furthermore the Examiner notes that at the time of the invention the use of negative exponents in exponential equations was well-known in the networking art for describing an attribute of decreasing value such as in the context of decay functions, degradation curves and damping rates.

Juttner Column 13 Lines 55-65 figure 9, Column 14 Lines 20-45 disclosed that there is a point in time wherein where a path can be found for all source-destination pairs, at which point the average cost of the paths will decrease with the delay bound since the algorithms are able to find paths with lower costs and higher delay bounds. Thus Juttner is describing an attribute with decreasing value and hence it would have been obvious that this portion of the Juttner curve may be described using negative exponents in exponential equations. The motivation for said combination would have been to enable mathematical models that describe the network attributes concisely and consistently.

The Applicant seems to be differentiating the claimed invention as a mathematical formula as shown in Applicant Specification Page 8 Line 24. The Examiner notes that the said formula follows the basic algebra rules for operating on exponential identities, such as described by the following :  $x^a x^b = x^{(a+b)}$  . The said rule indicates using products of exponential functions.

The rules for operating on exponential identities presented above indicated a product of exponentials. It would have been obvious to a person of ordinary skill in the art to substitute negative exponentials into the rule and perform the resulting mathematical operation as indicated by the rule.

The Examiner notes that the advantages of compound metrics represented by negative exponentials are easily observed by a person of ordinary skill in the art by substituting simple values into the said rule, such as where exponents **a,b** = {-1,0,or 1} and plotting the results on a line graph.

### ***Conclusion***

**Examiner's Note:** Examiner has cited particular columns and line numbers in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner.

In the case of amending the claimed invention, Applicant is respectfully requested to indicate the portion(s) of the specification which dictate(s) the structure relied on for proper interpretation and also to verify and ascertain the metes and bounds of the claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Greg Bengzon whose telephone number is (571) 272-3944. The examiner can normally be reached on Mon. thru Fri. 8 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Vaughn can be reached on (571)272-3922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/G. B./  
Examiner, Art Unit 2144

/Paul H Kang/  
Primary Examiner, Art Unit 2444